BUREAU OF HIGHWAYS
REQUEST FOR PROPOSAL
for
QUALIFICATIONS BASED SELECTION FOR PREQUALIFIED SERVICES

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is currently prequalified for this type of work and you are interested in providing services, please indicate your interest by submitting a Proposal. The Proposal must be submitted in accordance with the latest "Vendor Selection Guidelines for Service Contracts", available on the MDOT website.

For efficiency sake, we are asking that the vendor firm provide 4 paper copies of the Proposal to the MDOT project manager named in the attached scope of services.

These copies must be received by March 4, 2005**.** Fax and electronic copies are not acceptable.

In addition, provide one unbound copy to:

Regular Mail:
Secretary, Operations Contract Support
Michigan Department of Transportation
P.O. Box 30050
Lansing, MI 48909

OR

Overnight Mail:
Secretary, Operations Contract Support
Michigan Department of Transportation
425 W. Ottawa
Lansing, MI 48933

This copy is to be received within three working days after the due date and time specified above. Please do not deliver in person.

Any questions relative to the scope of services must be submitted by e-mail to the MDOT project manager. Any questions must be asked at least three working days prior to the due date and time specified above. All questions and their answers will be placed on the MDOT website as soon as possible after receipt of the questions. The names of vendors submitting questions will not be disclosed.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

The selection team will review the information submitted and will select the firm considered most qualified to perform the engineering services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

The maximum allowable pages for your proposal shall follow the guidelines detailed in Exhibit F of the Vendor Selection Guidelines (October 2004) for > $500,000.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

The scope of services is attached to this solicitation.

REVISED SCOPE OF DESIGN SERVICES

Approximately 35 Bridges for CPM work - JN(s) to be determined
These Bridges will be divided into two projects (one for the University Region Bridges & one for the Metro Region Bridges). MDOT has the option to choose up two Consultants for these projects.

PROJECT LOCATION: Current locations of bridges throughout the Metro & University Region (actual number of bridges may be subject to change):

UIVERSITY REGION

Jackson TSC	
R01 of 38101	**I-94 over Conrail & the Grand River**
B04 of 46032	**M-156 over Silver Creek**
B05 of 46041	**M-34 over the South Branch of the Raisin River**
B02 of 46062	**US-223 over the Raisin River**
R02 of 46062	**US-223 over the Norfolk & Southern Railroad**
B01 of 46082	**M-50 over the Raisin River**
Brighton TSC	
S06 of 47013	**Grand River Avenue over US-23 NB**
S03 of 47064	**I-96 EB over US-23 SB**
S04 of 47064	**I-96 WB over US-23 SB**
S05 of 47064	**I-96 EB over US-23 NB**
S02 of 47065	**M-59/I-96 BL over I-96**
S08 of 47065	**I-96 BL (On Ramp) over I-96 WB**
S13 of 47065	**I-96 EB over Old US-23**
S14 of 47065	**I-96 WB over Old US-23**
S05-3 of 81103	**M-14 EB over Ramp B US-23**
S09-1 of 81103	**US-23 BR N to US-23 N over US-23 SB (Ramp C)**

S01 of 81076	**US-23 over Carpenter Road**

Lansing TSC

R01 of 33032	**I-96 BL over GTW RR, Conrail RR & the Red Cedar River**
X01 of 33041	**GTW RR over US-27 (Lansing Road)**
R03 of 33045	**CSX RR & Trowbridge Road over I-496 EB**
B01 of 33051	**M-52 over the Red Cedar River**

METRO REGION

Macomb TSC

B03 of 50013	**M-53 NB over the Middle Branch of the Clinton River**
S10 of 50013	**M-53 SB over 25 Mile Road**
S13 of 50013	**M-53 NB over 25 Mile Road**

Oakland TSC

R01-3 of 63022	**I-96 EB over GTW RR**
R01-4 of 63022	**I-96 WB over GTW RR**
R02-3 of 63022	**I-96 EB over CSX RR**
R02-4 of 63022	**I-94 WB over CSX RR**
S01-1 of 63172	**I-75 NB over M-59**
S01-2 of 63172	**I-75 SB over M-59**
S18 of 63174	**I-75 SB On Ramp (Mid) over I-75 BL Ramps (Over & Under)**

Port Huron TSC

R01 of 77032	**M-25 over CSX RR & GTW RR**
B05 of 77033	**M-25 over Burtch Creek**
S20 of 77111	**SB I-94 Ramp over I-94**
S22 of 77111	**I-94 WB over M-25 Connector**

CONTROL SECTION, JOB NUMBER: CS 33032, 33041, 33045, 33051, 33082, 38101, 46032, 46041, 46062, 46082, 47013, 47064, 47065, 50013, 63022, 63172, 63174, 77032, 77033, 77111, 81103 & 81076 (at this time, but may change) - JN(s) to be determined

DESCRIPTION OF WORK: The work for this project may consist of structural steel repairs (beam ends generally), pin & hanger replacements, diaphragm and stiffener replacements, painting, joint replacements, bearing replacements, substructure repairs, and maintaining traffic on up to 35 structures.

I **Primary Prequalification Classification:**
Short & Medium Span Bridges

II **Secondary Prequalification Classification:**
Maintaining Traffic Plans & Provisions

The anticipated start date of the service is March 29, 2005.
The anticipated completion date for the service is July 11, 2005

DBE Requirement: 10%

MDOT Project Manager: Timothy E. Barry, P.E.

Design Support Area
Van Wagoner Building
425 W. Ottawa
P.O. Box 30050
Lansing, MI 48909
Phone: 517-335-7275
Fax: 517-335-2731
E-Mail: barryt@michigan.gov

I. DESCRIPTION OF WORK

The work for this project may consist of structural steel repairs (beam ends typically), pin & hanger replacements, diaphragm and stiffener replacements, painting, joint replacements, bearing replacements, substructure repairs, and maintaining traffic on up to 33 structures.

II. CONSULTANT RESPONSIBILITIES

The scope of design services to be done by the consultant is as follows:

A. Prior to submitting Proposal for Indefinite Delivery of Services, inspect the job site to determine the need for any additional work not included in the "Description of Work". If possible changes to the description of work are needed, submit a letter with your proposal detailing the changes that are recommended. (MDOT will not be reimbursing the consultant for the initial site visit, as the consultant is not yet authorized to do work.)

B. Provide solutions to any unique problems that may arise during the design of this project or that may affect the constructability of this project.

C. Preparation of both contract plans and bid item quantities using standard English units, as applicable. Stand-Alone Estimator's Worksheet (SAEW) shall be used to generate a bid item quantity database in both text (TXT) and comma separated value (CSV) formats.

D. The Consultant may be required to provide Design Services during the construction phase of this project. If Construction Assistance is required, then a separate authorization for those services will be issued.

E. Preparation of any specifications and/or special provisions required to supplement MDOT's Standard Specifications for Construction.

F. Meet with the MDOT Project Manager to review project, location of data sources and contact persons, and review relevant MDOT operations. The Consultant shall review and clarify project issues, data needs and availability, and the sequence of events and team meetings that are essential to complete the design by the project plan completion date. Attention shall be given to critical target dates that may require a large lead time, such as geotechnical requirements, ROW submittal dates, Railroad coordination requirements, utility conflict resolution, local agency meetings, etc.

G. Maintain a Design Project Record which includes a history of significant events (changes, comments, etc.) which influenced the development of the plans, dates of submittals and receipt of information.

J.

H. **P/PMS TASK 3390 - DEVELOP THE CONSTRUCTION ZONE TRAFFIC CONTROL CONCEPTS**
See Consultant Manual, Attachment B, for details.

I. **P/PMS TASK 3540 - DEVELOP THE MAINTAINING TRAFFIC PLAN**
See Consultant Manual, Attachment B, for details.

J. **P/PMS TASK 3830 - COMPLETE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN**
See Consultant Manual, Attachment B, for details.

K. **P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS**
See Consultant Manual, Attachment B, for details.

L. **P/PMS TASK 3850 - DEVELOP STRUCTURE FINAL PLANS AND SPECIFICATIONS**
See Consultant Manual, Attachment B, for details.

M. **P/PMS TASK 3870 - HOLD OMISSIONS/ERRORS CHECK (OEC) MEETING**
See Consultant Manual, Attachment B, for details.

N. The Consultant shall be required to prepare and submit a CPM network for the construction of this project. See **Attachment C** for details.

O. **P/PMS TASK 3910 – PREPARE FINAL PROJECT PACKAGE AND OBTAIN AUTHORIZATION**
See Consultant Manual, Attachment B, for details.

P. The Consultant representative shall record and submit type-written minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.

Q. Attend information meetings (i.e., public hearings, open houses, etc.) with the public and public officials to assist in responding to concerns and questions. This may require the preparation of displays such as maps, marked-up plans, etc.

R. Prepare and submit any information, calculations, hydraulic studies, or drawings required by MDOT for acquiring permits (i.e. NPDES), approvals (i.e. county drain commission) and related mitigation. MDOT will submit permit requests.

S. Attend any project-related meetings as directed by the MDOT Project Manager.

T. The MDOT Project Manager shall be the official MDOT contact person for the Consultant. The Consultant must either address or send a copy of all correspondence to the MDOT Project Manager. This includes all Subcontractor correspondence and verbal contact records. The MDOT Project Manager shall be made aware of all communications regarding this project.

U. The Consultant shall contact the MDOT Project Manager whenever discoveries or design alternatives have the potential to require changes in the scope, limits, quantities, costs, or right-of-way of the project.

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

III. PROJECT CONSTRUCTION COST

A. The estimated cost of construction is:

Approximately 35 Bridges Total Cost $10.1 million

The above construction total is the amount of funding programmed for this project. The Consultant is expected to design the project within the programmed amount. If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, then the Consultant may be required to submit a letter justifying the changes in the construction cost estimate.

IV. PROJECT SCHEDULE

The scheduled plan completion date for this project is **July 07, 2005.** The Consultant shall use the following events to prepare the proposed implementation schedule as required in the Guidelines for the Preparation of Responses on Assigned Design Services Contracts. These dates shall be used in preparing the Consultant's Monthly Progress Reports.

Target Date	Task #	Description
??/??/2005		Notice to Proceed (approximate date)
??/??/2005		Kickoff Meeting with Consultant Project Managers.
??/??/2005	3390	Develop Construction Zone Traffic Control Concepts (approximate meeting date)
??/??/2005	3540	Develop the Maintaining Traffic Plan
05/11/2005		3830 Complete the Construction Zone Traffic Control Plan (submit plans to MDOT for distribution)
05/11/2005		3840 Develop Final Plans and Specifications (submit plans to MDOT for distribution)
05/11/2005	3850	Develop Structure Final Plans and Specifications (submit plans to MDOT for distribution)
06/01/2005	3870	Omissions/Errors Check (OEC) Meeting (approximate date)
07/07/2005	3910	Final Construction Plan/Proposal package with recommendations incorporated to MDOT. (Mylars)
09/30/2005		Final Deliverables to MDOT

V. PAYMENT SCHEDULE

Compensation for this Scope of Design Services shall be on an actual cost plus fixed fee basis.

VI. MONTHLY PROGRESS REPORT

On the first of each month, the Consultant shall submit a monthly project progress report to the Project Manager, ***Timothy Barry***. The monthly progress report shall follow the guidelines in Attachment A.

VII. FORMAT

Full size plans (cut size 24" x 36") consisting of plan sheets and profile sheets will be required.
Other plan sheets that are required for this project shall be completed by the Consultant. These include, but are not limited to the following plan sheets:

A. The title sheet. MDOT will provide a map of the area on a disk in our workstation format. If the map is not available, MDOT will provide a map that could be used. The Consultant shall be responsible for any revisions to the title sheet and the title sheet and map shall meet MDOT format and layout guidelines.

B. Project specific Special Details.

All plans, special provisions, estimates, and other project related items shall meet all MDOT requirements and detailing practices (i.e., format, materials, symbols, patterns, and layout) or as otherwise directed by the Project Manager.

All plans, specifications, and other project related items are subject to review and approval by MDOT.

VIII. UTILITIES

The Consultant shall be responsible for showing on the plans the location and names of all existing utilities within the limits of the project. MDOT shall provide the consultant with all utilities information. In the course of resolving utility conflicts, the Consultant shall make modifications to the plans or design details and provide assistance as directed by the MDOT Utility Permits Engineer and/or Project Manager. The Consultant shall attend any utility meetings called to ensure that the concerns are addressed on the plans involving utilities. The Consultant shall assist in the review of utility permit requests to ensure compatibility with the project.

IX. TRAFFIC CONTROL AND MDOT PERMITS (REVISED)

While performing the tasks outlined in this Project Scope of Design Services (i.e. - soil borings, surveys...) The Consultant shall be responsible for all traffic control required to complete the task.

The Consultant shall be responsible for obtaining up to date access permits and pertinent information for tasks in MDOT Right of Way (ROW). This information can be obtained through Pam Sebenick, Utilities/Permits Section, Real Estate Division at (517) 373-7680

X. PRE-QUALIFICATION AND SUBCONTRACTING OF CONTRACT WORK

Any task(s) for which the Consultant is not prequalified must be completed by a Subcontractor that is pre-qualified for that task(s). Any questions regarding prequalification should be directed to Phil Brooks, Prequalification Manager, at (517)335-2514.

The DEPARTMENT=S prequalification is not a guarantee or warranty of the SUBCONTRACTOR=S ability to perform or complete the work subcontracted. The CONSULTANT remains fully responsible to the DEPARTMENT for completion of the work according to the *authorization* as if no portion of it had been subcontracted.

All SUBCONTRACTOR communications with the DEPARTMENT shall be through the CONSULTANT to the MDOT Project Manager. This requirement may be waived if a written communication plan is approved by the MDOT Project Manager.

The DEPARTMENT may direct the immediate removal of any SUBCONTRACTOR working in violation of this subsection. Any costs or damages incurred are assumed by the CONSULTANT by acceptance of the *authorization*. It is further understood that the CONSULTANT=S responsibilities in the performance of the contract, in case of an approved subcontract, are the same as if the CONSULTANT had handled the work with the CONSULTANT=S own organization.

XI. MDOT RESPONSIBILITIES (GENERAL)

A. Schedule and/or conduct the following:
   1. Project related meetings.
   2. Utility Meetings.
   3. Quantity summary sheets and final item cost estimates.
   4. Packaging of plans and proposal.

B. Furnish Special Details and pertinent reference materials.

C. Furnish prints of an example of a similar project and old plans of the area, if available.

D. Coordinate any necessary utility relocations.

E. Furnish diskette of file and instructions for the MDOT Stand Alone Estimator's Worksheet(SAPW).

VENDOR PAYMENT:

All invoices/bills for services must be directed to the Department and follow the 'then current' guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's Bulletin Board System. This document contains instructions and forms that must be followed and used for invoicing/billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Vendor for Services rendered shall not exceed the "Cost Plus Fixed Fee Not to Exceed Maximum Amount" unless an increase is approved in accordance with the contract with the Vendor. All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Direct expenses will not be paid in excess of that allowed by the Department for its own employees. Supporting documentation must be submitted, with the invoice/bill, for all billable expenses on the Project. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the CE activities of this Project. Hours spent in administrative, clerical, or accounting roles for billing and support, are not considered allowable hours; there will be no reimbursement for these hours.

Reimbursement for overtime hours will be limited to time spent on this project in excess of forty hours per week. Any variations to this rule should be included in the price proposal

ATTACHMENT "A"

MONTHLY PROGRESS REPORTS

The first two pages of this attachment are the necessary layout of the Monthly progress reports and the last three pages are a completed example.

Control Section 00000
Job Number 00000C
Structure Number S00
Date 00/00/00

MONTHLY PROGRESS REPORT

A. Work accomplished during the previous month.

B. Anticipated work items for the upcoming month.

C. Real or anticipated problems on the project.

D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.

E. Items needed from MDOT.

F. Copy of Verbal Contact Records for the period (attached).

Structure Number - Control Section - Job Number
Route, Location Description
Design Schedule as of 00/00/95

Original (Anticipated) Authorized Date	or **Actual** Dates	
00/00/00	**00/00/00**	Initial project meeting.
00/00/00	**00/00/00**	Completion of Pre-Grade Inspection.
00/00/00	**00/00/00**	First maintaining traffic coordination meeting.
00/00/00	**00/00/00**	Completion of design survey.
00/00/00	**00/00/00**	Submittal of preliminary plans for geometric review.
00/00/00	(00/00/00)	Submit request for soil borings and soils recommendations.
00/00/00	(00/00/00)	Submittal of Preliminary Right-Of-Way Plans.
00/00/00	(00/00/00)	Submittal of Grade Inspection materials.
00/00/00	(00/00/00)	Completion of Grade Inspection.

LIST TASKS, SUBMITTALS, APPROVALS AND MEETINGS AS OUTLINED IN SCOPE OF DESIGN SERVICES OR AS NEEDED. THIS LIST IS JUST AN EXAMPLE.

00/00/00	(00/00/00)	Completion of Partially Completed Final Plans review (approximately 4 weeks after submittal).
00/00/00	(00/00/00)	Submittal of final plans and project material (minimum of 2 weeks prior to the Plan Completion Date).
00/00/00	(00/00/00)	Submittal of project file and related documents.

Control Section 12345
Job Number 11111C
Structure Number S02
Date 07/31/95

MONTHLY PROGRESS REPORT

A. Work accomplished during the previous month.

1. During the last month we completed the Final Right of Way plans and submitted them to Rob Lippert on 07/01/95.

B. Anticipated work items for the upcoming month.

1. Submit the Preliminary Plans and related material on 08/11/95.

2. Attend the meeting regarding the Ameritech lines on the bridge, scheduled for 08/12/95.

C. Real or anticipated problems on the project.

1. We foresee no problems at this time.

D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.

1. The design is falling behind schedule because we had problems resolving the geometries of the ramps in relation to the bridge. The Preliminary Plan submittal will be the only task affected by this delay because we will make up the lost time prior to submitting the Final Plans and Specifications.

E. Items needed from MDOT.

1. Prior to final Plan submittal we will need the latest Special provision and Supplemental Specification checklist.

F. Copy of Verbal Contact Records for the period (attached).

1. Discussed bridge and ramp geometries with Tom Myers of M$DOT Traffic and Safety Division on 07-24-95.

SN: S02 - CS: 12345 - JN: 11111C
M-111, from There Village Limits to north of That Road
Design Schedule as of 07/31/95

Original (Anticipated) Authorized Date	or **Actual** Dates	
01/12/95	**01/05/95**	Initial project meeting.
01/29/95	**01/29/95**	First maintaining traffic coordination meeting.
02/17/95	**02/10/95**	Completion of design survey.
02/29/95	**02/29/95**	Submittal of Base Plans and related material.
03/12/95	**03/13/95**	Submittal of Preliminary Right-Of-Way Plans.
03/20/95	**03/19/95**	Completion of Base Plan Review.
07/01/95	**07/01/95**	Submittal of Final Right-Of-Way plans.
07/11/95	(08/11/95)	Submittal of Preliminary Plans and related material.
09/15/95	(09/15/95)	Completion of Preliminary Plan Review.
09/16/95	(09/16/95)	Second maintaining traffic coordination meeting.
09/25/95	(09/23/95)	Submittal and approval of Special Provision for Maintaining Traffic and related plans.
10/15/95	(10/15/95)	Submittal of Construction Plans and Specifications review materials.
11/11/95	(11/11/95)	Completion of Construction Plans and Specifications review.
12/10/95	(12/10/95)	Submittal of plans and project material after incorporating final review comments.
12/25/95	(12/25/95)	Submittal of project file and related documents.

VERBAL CONTACT RECORD

Control Section 12345
Job Number 11111C
Structure Number S02
Date 07/31/95

Joe Engineer talked to Tom Myers and decided to use a 0.05'/ft super on ramp A leading into the bridge.

ATTACHMENT "B"

MDOT DESIGN CONSULTANT MANUAL (REVISED)

The MDOT Design Consultant Manual is now listed on the MDOT Bulletin Board System and can be found under the D_CONSLT Library. An index of the latest version of the task descriptions along with any revisions will be included as part of this authorization.

CONSULTANTS are still encouraged to review and provide comment on the draft pages from the MDOT Design Consultant Manual. Please send suggestions to:

Katharine J. Hulley
Supervising Engineer
Operation Contract Support
Michigan Department of Transportation
425 West Ottawa
P.O. Box 30050
Lansing, MI 48909

P/PMS TASK	CURRENT DATE	LATEST REVISION DATE
3120 - CONDUCT STRUCTURE DECK CONDITION SURVEY	**07/29/99**	
3330 - CONDUCT DESIGN SURVEY	**07/29/99**	
3340 - CONDUCT STRUCTURE SURVEY	**07/29/99**	
3350 - CONDUCT HYDRAULICS SURVEY	**07/29/99**	
3360 - PREPARE BASE PLANS	**06/22/99**	
3361 - REVIEW AND SUBMIT PRELIMINARY RIGHT OF WAY (PROW) PLANS	**07/16/99**	
3370 - PREPARE STRUCTURE STUDY	**06/16/99**	
3380 - REVIEW BASE PLANS	**06/29/99**	
3390 - DEVELOP THE CONSTRUCTION ZONE TRAFFIC CONTROL CONCEPTS	**07/16/99**	
3510 - PERFORM ROADWAY GEOTECHNICAL INVESTIGATION	**07/29/99**	
3520 - CONDUCT HYDROLOGIC, HYDRAULIC AND SCOUR ANALYSES	**08/29/00**	**revised per P. Schriner**
3530 - CONDUCT FOUNDATION STRUCTURE INVESTIGATION	**07/16/99**	
3540 - DEVELOP CONSTRUCTION ZONE TRAFFIC CONTROL PLAN	**07/16/99**	
3551 - DEVELOP/REVIEW PRELIMINARY TRAFFIC SIGNALS PLAN	**07/16/99**	**added to index 1/5/2000**
3552 - DEVELOP PRELIMINARY PERMANENT PAVEMENT MARKING PLAN	**07/16/99**	
3553 - DEVELOP PRELIMINARY NON - FREEWAY SIGNING PLAN	**07/16/99**	
3554 - DEVELOP PRELIMINARY FREEWAY SIGNING PLAN	**07/16/99**	
3570 - PREPARE PRELIMINARY STRUCTURE PLANS	**07/16/99**	
3580 - DEVELOP PRELIMINARY PLANS	**06/30/99**	
3581 - FINAL RIGHT-OF-WAY PLANS	**07/16/99**	
3590 - REVIEW PRELIMINARY PLANS	**06/29/99**	
3670 - DEVELOP MUNICIPAL UTILITY PLANS	**06/30/99**	
3675 - DEVELOP ELECTRICAL PLANS	**07/01/99**	

P/PMS TASK	CURRENT DATE	LATEST REVISION DATE
3710 - DEVELOP REQUIRED MITIGATION (FOR INFORMATION ONLY, THIS IS NOT A CONSULTANT TASK)	**07/16/99**	
3720 - SUBMIT ENVIRONMENTAL PERMIT APPLICATIONS (FOR INFORMATION ONLY, THIS IS NOT A CONSULTANT TASK)	**07/16/99**	
3821 - COMPLETE/REVIEW TRAFFIC SIGNAL PLANS	**07/16/99**	
3822 - COMPLETE PERMANENT PAVEMENT MARKING PLAN	**07/16/99**	
3823 - COMPLETE NON-FREEWAY SIGNING PLAN	**07/16/99**	
3824 - COMPLETE FREEWAY SIGNING PLAN	**07/16/99**	
3830 - COMPLETE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN	**06/22/99**	
3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS	**07/02/99**	
3850 - DEVELOP STRUCTURE FINAL PLANS AND SPECIFICATIONS	**07/29/99**	
3870 - HOLD OMISSIONS/ERRORS CHECK (OEC) MEETING	**07/13/99**	
4120 - OBTAIN PRELIMINARY TITLE COMMITMENTS	**06/29/99**	
4130 - PREPARE MARKED FINAL R.O.W. PLANS	**06/29/99**	
4140 - PREPARE PROPERTY LEGAL INSTRUMENTS	**06/29/99**	
4510 – CONDUCT R.O.W. SURVEY AND STAKING		
5010 - CONSTRUCTION PHASE ENGINEERING ASSISTANCE	**07/29/99**	

ATTACHMENT "C"

CONSTRUCTION CRITICAL PATH NETWORKS

I. INTRODUCTION

The Consultant is required to submit a Construction Critical Path Network at various points in the design process. Refer to the following:

P/PMS TASK 3830 - COMPLETE THE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

Construction Critical Path Networks are often needed to develop the progress schedule for a project. They are required on any project designated to include an Incentive/Disincentive or Special Liquidated Damages clause. Construction Critical Path Networks are also recommended for projects with the following characteristics:

1. New construction.
2. Major reconstruction or rehabilitation on an existing roadway that will severely disrupt traffic.
3. Unique or experimental work.
4. More than one construction season.
5. Complex staging(multiple stages with traffic shifts).

As noted in MDOT=s Construction and Technology Instructional Memorandum 1997-7, Progress Schedule Determinations/Critical Path Rates,

> A*preparation of a Critical Path is a requirement on <u>all</u> consultant-designed projects, regardless of the project type or complexity.*@

The MDOT Resident Engineer assigned to the project should be consulted when developing Construction Critical Path Networks.

MDOT requires the precedence diagramming method. The Consultant will submit this network in MPX version 4.0.

II. NETWORK DEVELOPMENT

The network will be defined using the following steps.

1. Activity definition.
2. Activity sequencing.
3. Duration estimation.
4. Schedule development.

1. ACTIVITY DEFINITION

The Consultant will define the specific activities in enough detail so that the proper objectives will be met. The Consultant must identify assumptions (those factors considered true, real or certain). Supporting detail for the activities should be documented and organized as needed to simplify the review of the activities by MDOT personnel.

The Construction Critical Path Network must start with the ALetting Date@ as the first activity and terminate with the AEnd of Project@ as the finish activity.

A sufficient number of activities will be required with sufficient detail so that the controlling construction operation(s) may be identified. Notation on each activity shall include a brief work description and activity time duration.

2. ACTIVITY SEQUENCING

Activity sequencing involves identifying and documenting interactivity dependencies. The Consultant must sequence activities accurately to support later development of a realistic and achievable construction schedule. Two types of dependencies should be considered. Mandatory dependencies are inherent in the nature of the work being done, such as construction sequencing. Discretionary dependencies are based on a knowledge of the work to be done. Constraints are used to show how the activities relate to each. The Consultant must include documentation supporting all discretionary dependencies used in the project. All activities must lead to another activity. Only Start to Start, Finish to Finish and Finish to Start relationships will be allowed. All logic shall show how the given activity is dependent on its preceding activities.

3. DURATION ESTIMATION

After the Consultant has sequenced the activities, the Consultant should determine the activity duration. Activity duration estimating involves assessing the number of work periods likely to be needed to accomplish each activity. Duration (working days): No activity will have a duration greater than 20 working days unless approved by the Engineer. Activities that will be allowed to exceed 20 working days include, but are not limited to, working drawing approvals or other activities not under the control of the Contractor. If requested by the Engineer, the Consultant shall explain the reasonableness of activity time durations. The approved MDOT production rates will be used in estimating activity duration. These are available in the Supplemental Information section of this attachment. The Consultant must document and submit all assumptions made during the duration estimation to MDOT.

4. SCHEDULE DEVELOPMENT

The actity sequencing, duration estimations and the calendars are combined to create the construction schedule. During the development of the schedule the Consultant will verify:

1. The required schedule to build the project.
2. The constructability of the project.
3. If the maintaining traffic scheme will work.
4. If seasonal limitations will affect the construction.
5. Any other project specific considerations.

The MDOT Calendars will be used by the Consultant in developing the network. The calendars are based on a 4, 5 or 6 day work week. The MDOT Calendars are included in the Supplemental Information section of this attachment.

At this point there should be no negative float in the network. If there is, there is an error in the network and the error must be corrected before network submittal.

All summary tasks shall be removed prior to submittal to MDOT Project Manager

III. DELIVERABLES

After this final step the design consultant will submit the finished CPM schedule to MDOT

1. Documents

A. 11" x 17" plot of the network. The critical path shall be clearly identified on the plot. A larger plot may be required for complex networks.

B. Work Day / Completion Date Determination Worksheet.

C. List of any other assumptions or controlling factors used in creating the network. For example, permit or maintiang traffic restrictions.

2. Electronic Format

This section sets the requirements for the eletronic submittal of the Consultant=s Construction Network. All networks shall be submitted on a 3.5 inch floppy disk (or via E-mail) using one of the following formats:

A. **Standard Electronic Media Format:** This is a standard ASCII text file containing the data elements below, in the order specified. This file can be created using any text editor or word processing application (i.e., MS-Word, WordPerfect, Notepad, Write) but must be saved as an ASCII file.

The **first line** will provide a descriptive header describing the submittal and containing:

Control Section
Job Number
Route
Consultant name
Date of Submital

The next line will be **blank**, followed by multiple data lines.

Each **data line** will contain one record pertaining to one task of the job. Separate data fields by a comma. Fields within each task line are as follows:

(Note that the term "task" is synonymous with "activity." Leave fields that are not required blank)

(1) Task # (Job # followed by a hyphen followed by this task's unique 4 digit task number. This is the Preceding Event Activity Code)
(2) Description of Task, Milestone or Hammock, blank if this record is a constraint
(3) Calendar (see attached list)
(4) Duration of task, blank for constraints
(5) Task # of the next task (Succeeding Event) - leave blank if this record is not a constraint or hammock
(6) Type of constraint (FS, SS, FF) - leave blank if this record is not a constraint.
(7) Delay, if required
(8) Original "Baseline" Start Date
(9) Original "Baseline" Finish Date
(10) Current (forecast) Start Date (early start)
(11) Current (forecast) Finish Date (early finish)
(12) Estimated completion date (if different from early start + current duration)
(13) Late Start Date
(14) Late Finish Date
(15) Actual Start Date
(16) Actual Finish Date

Example - each line contains the following:

Task # (preceding event), Description, Calendar, Duration, Next Task # (succeeding event), Constraint Type, Delay, Baseline Start, Baseline Finish, Early Start, Early Finish, Estimated Completion Date, Late Start, Late Finish, Actual Start, Actual Finish, Total Float.

B. **Primavera Project Planner(P3) 2.0 Export Procedure:** Users who have Primavera Project Planner(P3) version 2.0 can automatically create a export file by following the below export procedure below. **Users having an older version of Primavera may use the applications export feature only if they are able to include all the data elements listed in the version 2.0 format.**

1. Choose Tools, Project Utilities, **EXPORT**
2. Click **ADD**, Then click **OK** to accept the next sequential ID number, or type a unique number to identify the specifications and click **OK**
3. Enter a description for the specification in the Title field
4. Specify data items to export

Activities
- Select **Contents of List**
- Use the Description column to specify which data items to export
- To add items, click the right mouse button in the Description column and choose from the list. Suggested Items include: **Activity ID, Activity Description, Actual Start, Actual Finish, Calendar ID, Early Start, Early Finish, Late Start, Late Finish, Original Duration.**
- Select **All Current, All Target**, or **All Target2**
- Set Description Length to 48

OR

Constraints
- Select **Successor relationships** - Choose this option to export Activity IDs and their corresponding successors only. Lags and relationship types will also be displayed in this output file.

5. Click **FORMAT** in Export Dialog Box
6. In the Output file section, enter a new name and path (ex. A:\actexp or A:\conexp). Do not include a file extension.
7. In the type field, click the minimize button and choose the **[.PRN] - ASCII** file format for the output file.
8. Select **CALENDAR** for Date Format
9. Set ASCII Output Field Separation to **1** and Blank column width to **0**
10. Click **RUN**
11. In the Output Options dialog box, click on **OK**

NOTE: A COMPLETED FILE EXPORT WILL CONSIST OF 2 EXPORT FILES (ACTIVITIES & CONSTRAINTS)

C. **Microsoft Project Export Procedure:** Users of Microsoft Project Version 4.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the Save File as Type box Select **MPX 4.0**

3. On the drive box select a: or whichever drive is the 3.5" Floppy drive
4. Click on **OK**
This saves the file in MPX format.

D. **Primavera Sure Track:** Users of Sure Track Version 2.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the filename box input a filename
3. In the Save File as Type box Select **MPX**
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**
This saves the file in MPX format

E. **Scitor Project Scheduler 7 Export Procedure:** Users of Scitor Project Scheduler Version 7 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In filename box select a filename
3. In the Save File as Type box Select MPX
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**
This saves the file in MPX format

F. **Export Files with Other Scheduling Applications:** Most scheduling packages have export functions similar to those described above. If the Consultant chooses to use packages with export capabilities, they shall include all items listed in the Standard Media Format in a text or ASCII type file.

IV. SUPPLEMENTAL INFORMATION

A. MDOT CRITICAL PATH-CONSTRUCTION TIME ESTIMATES

Drainage

Cross Culverts	
Rural Highways	40 m/day
Expressways	50 m/day
Large Headwalls	5 days/unit
Slab or Box Culverts	5 days/pour
Plowed in Edge Drain(production type project)	4500 m/day
Open Graded Underdrain(production type project)	1200 m/day
Sewers	
0m-5m(up to 1500mm)	40 m/day
0m-5m(over 1500mm)	25 m/day
5m-over(up to 1500mm)	25 m/day
5m-over(over 1500mm)	20 m/day
Jacked-in-place	13 m/day
including excavation pit & set up	min. 5 days
Tunnels	
hand mining	8 m/day
machine mining	20 m/day
including excavation pit & set up	min. 5 days
Manholes	3 units/day
Catch Basin	4 units/day

Utilities

Water Main(up to 400mm)	100 m/day
Flushing, Testing & Chlorination	4 days
Water Main(500mm-1050mm)	25 m/day
Flushing, Testing & Chlorination	5 days
Order & Deliver 600 mm HP Water Main	50 days/order
Gas Lines	100 m/day

Earthwork and Grading	**Metro Exp**	**Rural**
Embankment(CIP)	1500 m3/day	5300 m3/day
Excavation and/or Embankment(Freeway)	1500 m3/day	9200 m3/day
Excavation and/or Embankment(Reconstruction)	750 m3/day	3800 m3/day
Embankment(Lightweight Fill)	300 m3/day	600 m3/day
Muck(Excavated Waste & Backfill)		1500 m3/day
Excavation(Widening)		600 m/day
Grading(G & DS)		750m/day
Subbase and Selected Subbase(up to 7.4m)		600 m/day
Subbase and Selected Subbase(7.4 m & over)		450 m/day
Subgrade Undercut & Backfill		1500 m3/day
Subbase & Open-Graded Drainage Course		450 m/day

Surfacing

Concrete Pavement(7.3m)	450 m/day
Including Forming & Curing	min. 7 days
Bituminous Pavement(7.3m)	1200 m/day/course
Concrete Ramps(4.9m)	300 m/day
Including Forming & Curing	min. 7 days
Curb(1 side)	750 m/day

Concrete Shoulder-Median	1200 m2/day
Bituminous Shoulders(1 side per course)	750 m/day
Sidewalk	180 m2/day
Sidewalk(Patching)	65 m2/day

Structures

Sheeting(Shallow)	30 m/day
General Excavation at Bridge Site	750 m3/day
Excavation for Substructure(Footings)	1 unit/day
Piles(12m)	15 piles/day
Substructure(Piers & Abutments)	5 days/unit
Order and Delivery of Beams	
Plate Girders	100-120 days/order
Rolled Beams	90-120 days/order
Concrete Beams	50 days/order
Erection of Structural Steel	3 days/span
Bridge Decks	
Form & Place Reinforcement(60m Structure)	15 days
Pour Deck Slab(1 1/5 days/pour)	2 days/span
Cure	14 days
2 Course Bridge Decks	
Add 9 days for Second Course Latex	
Add 12 days for Second Course Low Slump	
Sidewalks and Railings	
Sidewalks and Parapets	5 days/span
Slip Formed Barriers	2 days/span
Clean Up	10 days
Pedestrian Fencing	
Shop Plan Approval & Fabrication	1-2 months
Erection	1 week/bridge
Rip Rap Placement	
Bucket Dumped	385 m^3/day
Bucket Dumped and Hand Finished	131-523 m^3/day
Retaining Walls	1 Panel/day min. 10 days

Railroad Structures

Grade Temporary Runaround	750 m3/day
Ballast, Ties & Track	50 m/day
Place Deck Plates	5 days/span
Waterproof, Shotcrete & Mastic	5 days/span
Railroad Crossing Reconstruction	10-15 work days (depends on if concrete base is involved)

Temporary Railroad Structures

Order & Deliver Steel	55 days/order

Erect Steel	1 day/span
Ties and Track	3 days/span

Pumphouse

Structure	30 days/m
Order & Deliver Electrical & Mechanical Equipment	90 days
Install Electrical & Mechanical Equipment	30 days

Miscellaneous

Removing Old Pavement	60 m/day
Removing Old Pavement for Recycling(7.3m)	450 m/day
Crushing Old Concrete for 6A or OGDC	1350 mtons/day
Removing Trees(Urban)	15 units/day
Removing Trees(Rural)	30 units/day
Removing Concrete Pavement	450 m2/day
Removing Sidewalk	250 m2/day
Removing Curb & Gutter	450 m/day
Removing Bitumin.ous Surface	1600 m2/day
Conditioning Aggregate	900 m/day
Bitumin.ous Base Stablizing	2500 m2/day
Ditching	600 m/day
Trenching for Shoulders	750 m/day
Station Grading	610 m/day
Clearing	8000 m2/day
Restoration(Topsoil, Seeding, Fertilizer & Mulch)	1650 m2/day
Sodding	2100 m2/day
Seeding	40000 m2/day
Guard Rail	230 m/day
Fence(Woven Wire)	360 m/day
Fence(Chain Link)	150 m/day
Clean Up	600 m/day
Concrete Median Barrier	300 m/day
Cure	min. 7 days
Reroute Traffic(Add 4 days if 1st item)	1 day/move
Concrete Glare Screen	450 m/day
Light Foundations	6 units/day
Order & Delivery	6-8 week/order
Remove Railing & Replace with Barrier(1 or 2 decks at a time)	4 days/side
Longitudinal Joint Repair	1600 m/day
Crack Sealing	4800 m/day
Joint and Crack Sealing	500 m/day
Repairing Pavement Joints - Detail 7 or 8	200 m/day
Seal Coat	6400 lane m/day
Diamond Grinding/Profile Texturing Concrete	3300 m2/day
Rest Area Building	
Order Material	3 months
Construct Building	9 months
Tower Lights	
Order and Deliver Towers	100 days
Weigh-In-Motion	
Order and Deliver Materials	1 month-6weeks
O & D with Installation	3 months
Raised Pavment Markers	300 each/day

Attenuators	2 each/day
Shoulder Corrugations, Ground or Cut	8 km-9.7 km/side/day
Aggregate Base	2900 m^2/day
Aggregate Shoulders	350 m^3/day
Freeway Signing - 3# Post Type	50 signs/day
Concrete Joint Repair(High Production-Projects with > 1000 patches)	
Average(1.8m)	50 patches/day
Large(>1.8m)	500 m2/day
Bridge Painting	90 m2/day
Pin and Hanger Replacement	3 beams/day
Order Pin & Hanger	60 days
Bridge Repair	
Scarifying(Including Clean up)	10000 m2/day
Joint Removal(Including Clean up)	4 m/day
Formin.g & Placement	3.5 m/day
Hydro-Demolishing	300 m/day
Barrier Removal	15 m/day
Placement	45 m/day
Hand Chipping (Other than Deck)	.24 m^3/person/day
Shoulder Corrugations, Ground or Cut	8 km-9.7 km/side/day
Casting Latex Overlay	250 m/day
Curing Overlay	
Regular	4 days
High Early	1 day
Thrie Beam Retrofit	30 m/day
Beam End Repairs	
Welded Repairs	.75 days/repair
Bolted Repairs	.50 days/repair
Bolted Stiffeners (Pair)	.25 days/repair
Grind Beam Ends	.25 days/repair
Welded Stiffeners (Pair)	.25 days/repair H-Pedestal
Repairs:	
Welded Repair	.50 days/each
Replacement	1 day/each
Deck Removal	235 m^2/day
Surfacing-Bituminous	
Metro-Primary(<18000mtons)	
Paving	540 mtons/day
Joints	150 m/day
Cold Milling	3400 m2/day
Aggregate Shoulders	900 mtons/day
Metro Primary(>18000mtons)	
Paving	540 mtons/day
Joints	200 m/day
Cold Milling	7500 m2/day
Metro Interstate(>18000mtons)	
Paving	1100 mtons/day
Joints	360 m/day
Aggregate Shoulders	900 mtons/day

Urban Primary(<18000mtons)	
Paving	640 mtons/day
Joints	100 m/day
Cold Milling	1700 m2/day
Rubblizing	1700 m2/day
Aggregate Shoulders	450 mtons/day
Urban Primary(>18000mtons)	
Paving	1000 mtons/day
Joints	120 m/day
Cold Milling	1700 m2/day
Aggregate Shoulders	500 mtons/day
Urban Interstate(>18000mtons)	
Paving	1200 mtons/day
Joints	220 m/day
Cold Milling	1700 m2/day
Rubblizing	5800 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(<18000mtons)	
Paving	640 mtons/day
Joints	120 m/day
Cold Milling	590 mtons/day
Crush & Shape	10000 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(>18000mtons)	
Paving	1100 mtons/day
Joints	150 m/day
Cold Milling	800 mtons/day
Crush & Shape	10000 m2/day
Rural Interstate(>18000mtons)	
Paving	1280 mtons/day
Joints	220 m/day

B. WORKSHEET

WORK DAY/COMPLETION DATE DETERMINATION

CS: _____ JN:

DESCRIPTION OF WORK: _____

MAJOR WORK ITEM	PRODUCTION QUANTITY	RATE	ESTIMATED TIME

TOTAL ESTIMATED TIME:

COMPLETION DATE: _____ (Calendar Days or Work Days)

COMMENTS:

C. MDOT CALENDARS

The following are the MDOT 4, 5 and 6 day calendars:

CALENDAR	DESCRIPTION	START	FINISH
1	Std - Apr 16 - Nov 15 - 4 day	APR 16	N0V 15
2	LP - Bit Stab - 4 day	MAY 15	OCT 15
3	UP - Bit Stab - 4 day	JUN 01	OCT 01
4	LP S of M-46 - Bit Pave - 4 day	MAY 05	NOV 15
5	LP N of M-46 - Bit Pave - 4 day	MAY 15	NOV 01
6	UP - Bit Pave - 4 day	JUN 01	OCT 15
7	LP - Bit Seal Coat - 4 day	JUN 01	SEP 15
8	UP - Bit Seal Coat - 4 day	JUN 15	SEP 01
9	Tree Planting - Deciduous - 4 day	MAR 01 OCT 01	MAY 15 NOV 15
10	Tree Planting - Evergreen - 4 day	MAR 01	JUN 01
11	South LP - Restoration - 4 day	MAY 01	OCT 10
12	North LP - Restoration - 4 day	MAY 01	OCT 01
13	UP - Restoration - 4 day	MAY 01	SEP 20
14	Full Year – Winter Work - 4 day	JAN 01	DEC 31
21	Std - Apr 16 - Nov 15 - 5 day	APR 16	NOV 15
22	LP - Bit Stab - 5 day	MAY 15	OCT 15
23	UP - Bit Stab - 5 day	JUN 01	OCT 01
24	LP S of M-46 - Bit Pave - 5 day	MAY 05	NOV 15
25	LP N of M-46 - Bit Pave - 5 day	MAY 15	NOV 01
26	UP - Bit Pave - 5 day	JUN 01	OCT 15
27	LP - Bit Seal Coat - 5 day	JUN 01	SEP 15
28	UP - Bit Seal Coat - 5 day	JUN 15	SEP 01
29	Tree Planting - Deciduous - 5 day	MAR 01 OCT 01	MAY 01 NOV 15
30	Tree Planting - Evergreen - 5 day	MAR 01	JUN 01
31	South LP - Restoration - 5 day	MAY 01	OCT 10
32	North LP - Restoration - 5 day	MAY 01	OCT 01
33	UP - Restoration - 5 day	MAY 01	SEP 20
34	Full Year – Winter Work - 5 day	JAN 01	DEC 31

35	Full Year - Expedited - 6 day	JAN 01	DEC 31